

# Intravenous Fluid Generation (IVGEN) for Exploration Missions

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# Overview

- IVGEN Objectives
- Project History
- ISS Demonstration Hardware Overview
- Exploration Mission Hardware Concept
- Post-flight hardware analysis
- Lifetime testing

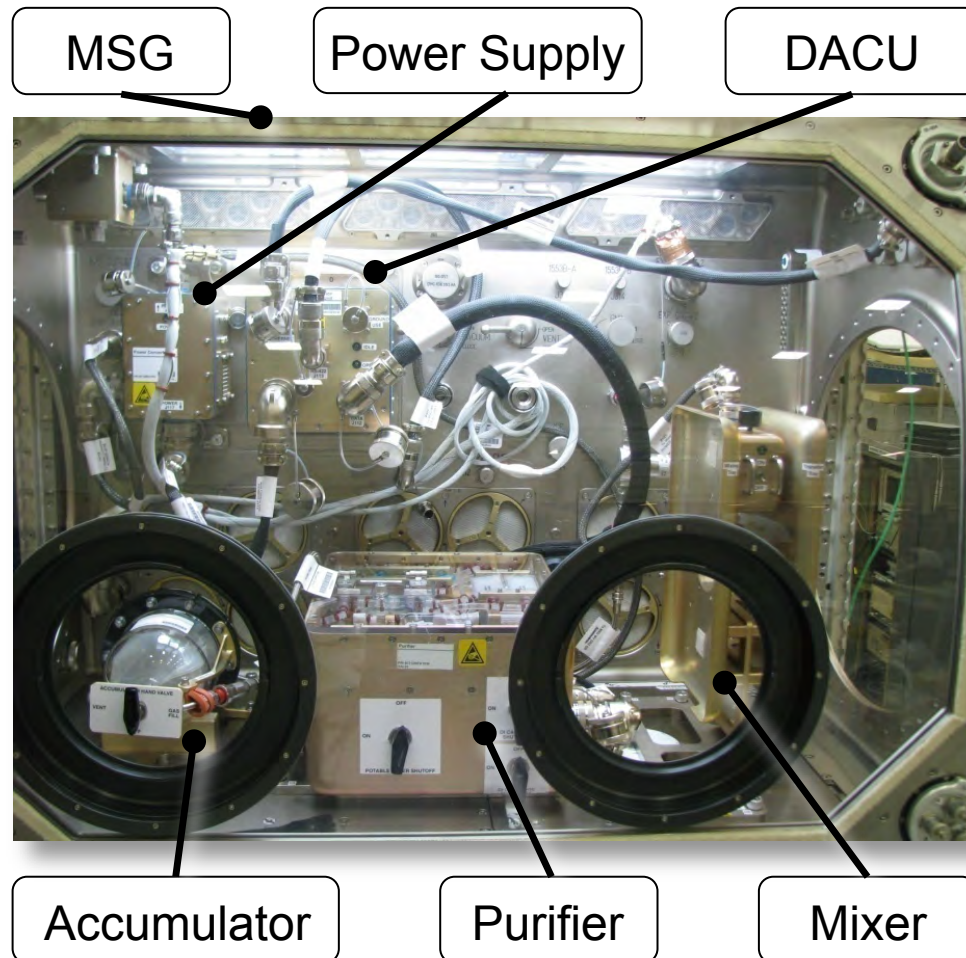
# IVGEN Objectives

- Design a system to produce IV fluids including:
  - Compact water purification
  - Integrated reduced gravity pharmaceutical mixing
  - Product meeting USP standards
- Minimize volume and mass for the required production rate
- Filter capacity should be easily re-scalable to meet exploration requirements and constraints
- Submit IVGEN to a Technology Demonstration aboard the ISS

# IVGEN Project History

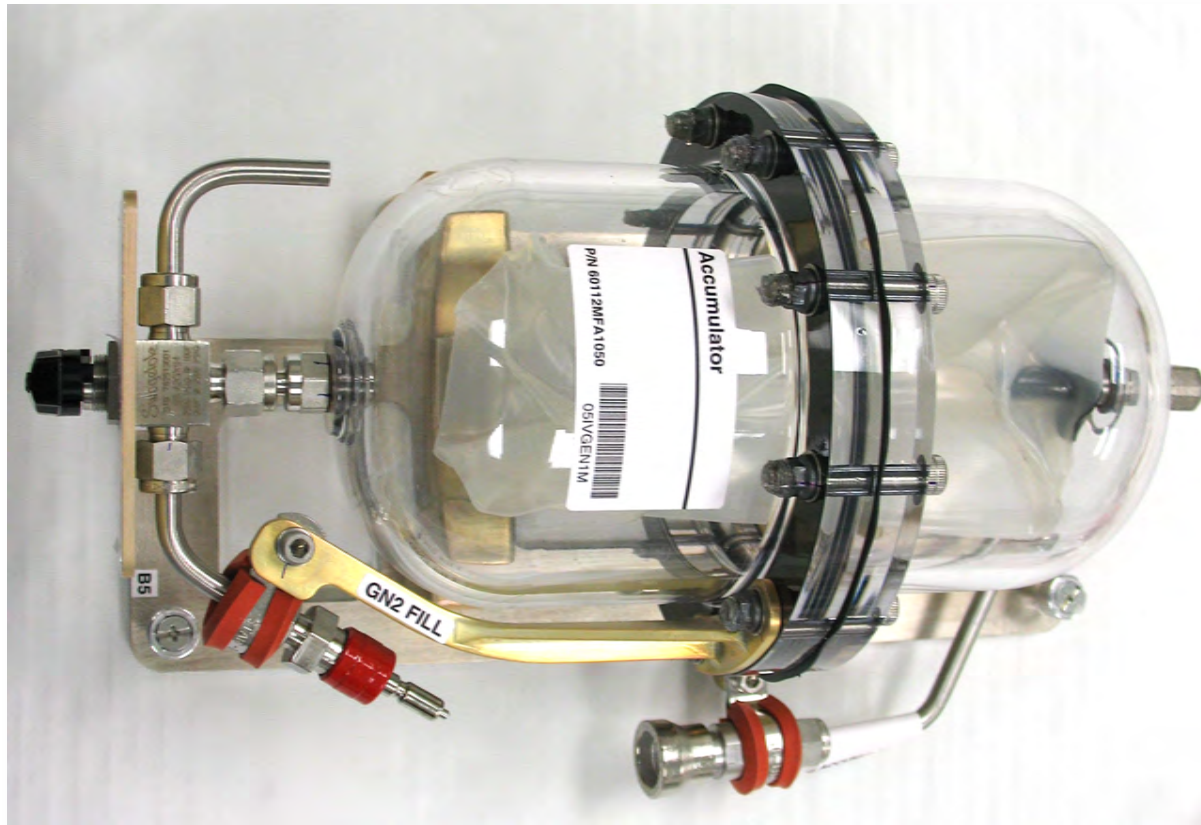
- Laboratory Study for Microgravity Mixing
- Trade Studies for Technologies to Generate Medical Grade Water in Microgravity
- Laboratory Study for Technologies to Generate Medical Grade Water in Microgravity
- Flight Experiment (May 2010) and Flight Data Analysis
- Exploration Mission Design Recommendation

# ISS Demonstration Hardware Overview



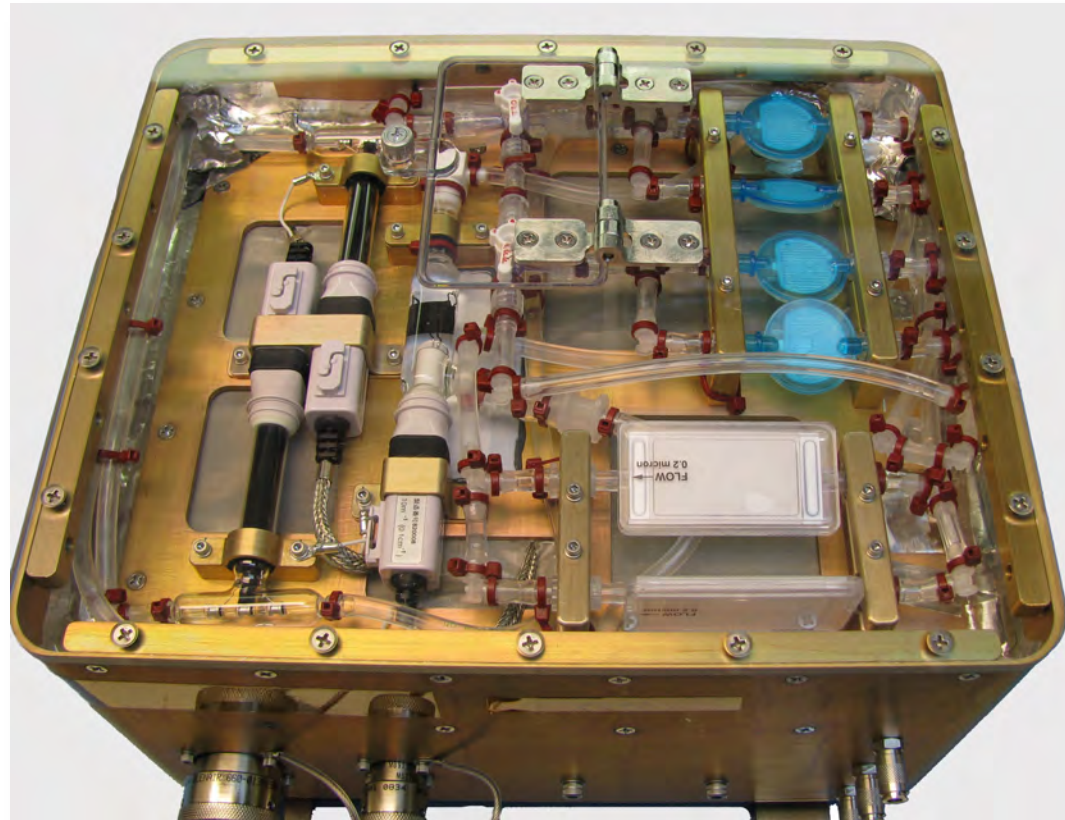
- Operate in the Microgravity Science Glovebox (MSG) on ISS
- Data Acquisition and Control Unit (DACU) handles data flow and storage
- Accumulator drives water flow through the system
- Purifier filters water and contains diagnostic instruments
- Mixer combines purified water with the sodium chloride

# ISS Demonstration Hardware Overview



Accumulator

# ISS Demonstration Hardware Overview



Purifier

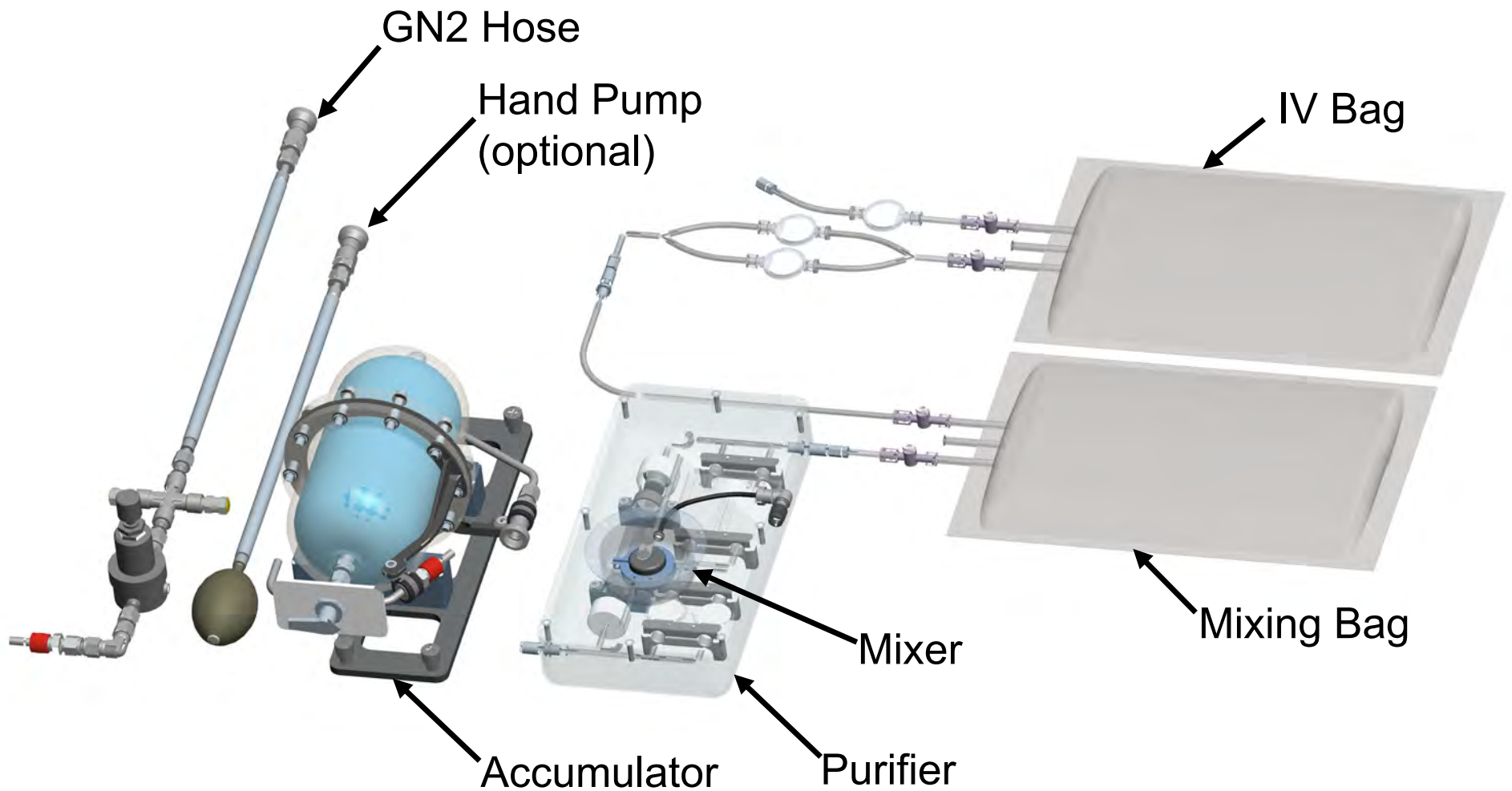


A large, clear, sterile collection bag containing a yellowish liquid, connected to a medical device with blue tubing and a control knob. The bag has a label that reads "Collection Bag" and "STERILE". The device has a blue knob and a label that reads "ING" and "NY".

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# IVGEN Exploration Design



# Post Flight Hardware Analysis

- Visual inspection for damage, contamination, and/or deterioration
- Assess system's ability after sitting unused for two years
- Measure hold-up volume of system
- Test remaining Saline Bags

# Ongoing Lifetime Testing

- Packaging material
- Packaging technique
- Cartridge material
- Resin volume



DI Resin



DI Resin Cartridge

